Prevalence of Asymptomatic Bacteriuria in Children and Adolescents with Type 1 Diabetes Mellitus

Thesis

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List of abbreviations

ADA ……American Diabetes Association

AER……Albumin excretion rate

AIDS……Acquired Immune Deficiency Syndrome

ASB ……Asymptomatic bacteriuria

AUC.....Area under the curve

BMI ……Body Mass Index

CDC……Centers for Diseases Control and prevention

CFU ……Colony forming unit

CGMS……Continuous glucose monitoring system

CI.....Confidence interval

CSII ……Continuous subcutaneous insulin infusion

CT……Computed tomography

CTLA-4 ……Cytotoxic T lymphocyte antigen 4

DCCT ……Diabetes Control and Complications Trial research group

DKA ……Diabetic Ketoacidosis

DM……Diabetes mellitus

DMSA……Dimercaptosuccinic acid

DNA …… Deoxyribonucleic acid

ER……Emergency room

ESRD……End-stage renal disease

FPG……Fasting plasma glucose

List of abbreviations (Cont.)

GAD ·····Glutamic Acid Decarboxylase

GDM·····Gestational diabetes mellitus

HbA1c·····Glycosylated hemoglobin

HBD-1 ·····Human beta-defensin-1

HHS·····Hyperosmolar hyperglycemic state

HLA·····Human Leucocytic Antigen

HNF1α····· Hepatic nuclear transcription factor 1 alpha

HNF4α·····Hepatic nuclear transcription factor regulating HNF1α

HNS····· Hyperosmolar non-ketotic state

IAA·····Insulin autoantibodies

ICA·····Islet cell antibodies

ICU·····Intensive care unit

IFG·····Impaired fasting glycemia

IGT·····Impaired glucose tolerance

ISPAD·····International society for pediateric and adolescents Diabetes

IVP·····Intravenous pyelogram

LDL.....Low density lipoprotein

MODY·····Maturity onset diabetes in young

MRBG·····Mean random blood glucose

MRI·····Magnetic Resonance Imaging

NPDR·····Non-proliferative diabetic retinopathy

NPH·····Neutral Protamine Hagedron

List of abbreviations (Cont.)

OGTT·····Oral glucose tolerance test

O.R ·····Odds Ratio.

PDR ·····Proliferative diabetic retinopathy

P·····Statistical value

ROC..... Receiver Operating Characteristic

SB ·····Significant bacteriuria

SD·····Standard deviaton

SGG·····Sialosyl galactosyl globoside

SMBG·····Self-monitoring of blood glucose

SPA·····Suprapubic aspiration

SPSS ·····Staistical package for social sciences

TMP-SMX ····Trimethoprim-sulfamehoxazole

UAE·····Urinary albumin excretion

UKDPS ·····United Kingdom Diabetes Prospective Studies

UPEC·····Uropathogenic E. coli

UTI ·····Urinary tract infection

VCUG·····Voiding cystourethrogram

WHO·····World Health Organization

X·····Mean

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Introduction

Diabetes mellitus (DM) is a metabolic disease characterized by hyperglycemia. It is caused by deficiency of insulin secretion or insulin action or both and results in abnormal metabolism of carbohydrate, protein and fat. It is most common endocrine-metabolic disorder of childhood and adolescence with important consequences for physical and emotional development ***(Mark, 2000).***

Asymptomatic bacteriuria (ASB) was defined as the presence of > 10^5 colony-forming units/mL of one or two of the same microorganisms in a culture of clean-voided midstream urine from a patient without symptoms of urinary tract infection (UTI) ***(Geerlings et al., 2001).***

Asymptomatic bacteriuria is common. Populations with structural or functional abnormalities of the genitourinary tract may have an exceedingly high prevalence of bacteriuria, but even healthy individuals frequently have positive urine cultures ***(Nicolle, 2003).***

The prevalence of significant bacteriuria (S.B) in diabetes mellitus has not been clearly established ***(Mattcucci et al., 2007)***.

***Rozsai et al., (*2003)** reported that the prevalence of ASB and leukocyturia was higher in diabetic children and young adults than in control subjects and that the spectrum of bacteria in patients with ASB was different from the usual spectrum in patients with UTI.

Aim of the work

The aim of the work was:

- To investigate the prevalence of asymptomatic urinary tract infection among patients with types I diabetes mellitus.
- To identify the type and antibacterial sensitivity patterns of the organisms causing these UTIs.
- To study the correlation between ASB and both the presence of microalbuminuria and the degree of glycemic control.

Diabetes Mellitus

Definition

Diabetes mellitus (DM) is a clinical syndrome of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion (absolute or relative), insulin action or both. Lack of insulin affects the metabolism of carbohydrate, protein, fat, and causes significant disturbance of water and electrolyte homeostasis (***ISPAD, 2007***).

The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs. The long-term effects include progressive development of specific complications such as, retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy (***American Diabetes Association, 2005***).

Several pathogenetic processes are involved in the development of diabetes. These processes destroy the beta cells of the pancreas with consequent insulin deficiency, and others that result in resistance to insulin action. The abnormalities of carbohydrate, fat and protein metabolism are due to deficient action of insulin on target tissues resulting from insensitivity or lack of insulin. The etiology and pathophysiology leading to the hyperglycemia, however, are markedly different among patients